

CG monosaccharides, oligosaccharides and polysaccharides or (b) a second group consisting of glycerol or dihydroxyacetone with a single recombinant microorganism having at least one exogenous gene expressing a glycerol dehydratase enzyme, the microorganism selected from the group consisting of members of the genera *Aspergillus*, *Saccharomyces*, *Zygosaccharomyces*, *Pichia*, *Kluyveromyces*, *Candida*, *Hansenula*, *Debaryomyces*, *Mucor*, *Torulopsis*, *Methylobacter*, *Salmonella*, *Bacillus*, *Streptomyces*, and *Pseudomonas*.--

REMARKS

Claims 2, 6, and 20-31 are pending in the case.
Claims 20-30 are allowed. Claims 2, 6 and 31 stand rejected.

Claim 2 has been amended to more distinctly claim Applicants' invention.

The subject matter of the original, dependent, product-by-process Claim 19, canceled in the amendment filed 26 March 1998, is added as new independent Claim 34 for purposes of maintaining the pendency of this subject matter.

Double-Patenting Under 35 USC § 101

Applicants note with appreciation the withdrawal of the rejection of Claim 22 for double patenting.

Judicially-Created Doctrine for Obviousness-Type Patenting

Applicants note with appreciation the withdrawal of the rejections of Claims 2 and 6 under the judicially-created doctrine of obviousness-type double-patenting with regard to US Patent NO. 5,686,276 and co-pending Application No. 08/687,852, and the rejection of Claims 20-21 and 23-31 with regard to US Patent No. 5,633,362.

Claim 6 remains rejected under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-10 and 13-16 of U.S. Patent 5,686,276 in view of Daniel et al. (1992), in light of Daniel et al., (1995).

Applicants will file a terminal disclaimer with respect to Claim 6 and Claims 1-10 and 13-16 of U.S. Patent 5,686,276. In

preparing this response, the undersigned discovered an error in the assignment that prevents the immediate submission of the terminal disclaimer. Corrective steps are being taken to permit the filing of the terminal disclaimer.

Rejections under 35 U.S.C. § 112:

Applicants note with appreciation the withdrawal of the rejection of Claims 26-30 in light of Applicants' submission of evidence of timely compliance with the deposit requirements. Applicants also appreciate the withdrawal of the rejection of Claims 2 and 6 under 35 USC 112, second paragraph in light of previous amendments.

The Examiner found Applicants' arguments in light of the previous amendments of Claim 2, unpersuasive. Specifically, the Examiner found no limitation in Claim 2 to a recombinant microorganism.

Claim 2 has been amended to include the limitation that the microorganism be recombinant (i.e., "having an exogenous gene encoding a glycerol dehydratase enzyme").

Claims 2, 6, and 31 remain rejected under 35 U.S.C. § 112, first paragraph, as the Examiner views the specification as enabling only for claims drawn to processes for the production of 1,3-propanediol using a glycerol dehydratase enzyme isolated from *Klebsiella pneumoniae*. Applicants traverse.

The Examiner notes that the specification is silent with respect to methods to identify and purify non-*Klebsiella* dehydratase enzymes, and concludes that the claims are enabled only to the extent of a *Klebsiella*-derived dehydratase enzyme. The Examiner argues that Bouvet et al. (representing the state of the art at the time the invention was made) taught that only a few rare strains of bacteria had the ability to utilize glycerol and thus possessed the *dha* region.

Claims 2, 6 and 31 are drawn to methods limited to the use of a dehydratase enzyme. Claims 2 and 31 are further limited to the use of a glycerol dehydratase. The specification, in combination with the knowledge of the state of the art at the time the invention was made, enables the identification, isolation and expression of non-*Klebsiella* dehydratases,

without requiring undue experimentation. The specification defines "dehydratase" on the basis of activity (page 9). As so defined, the only dehydratase in consideration are those that convert glycerol to 3-hydroxypropion-aldehyde. Glycerol dehydratases are further limited as those having a substrate specificity for glycerol. The specification provides teaching as to how this activity may be measured (see page 20 at "Enzyme Assays"). Additionally, the sequence of the genes encoding a significant portion of the instant *Klebsiella*-derived dehydratase appears in the specification (see page 23, SEQ ID NO:1 and discussion of open reading frames). The skilled person is well able to use this information, in combination with standard protocols in molecular biology (i.e. Sambrook, J. et al., Molecular Cloning: A Laboratory Manual, Second Edition, Cold Spring Harbor Laboratory Press (1989).; cited on page 19 of the specification) and literature in the art (such as Bouvet et al.,) which identify those organisms possessing enzymes capable of utilizing glycerol, (including, *Citrobacter*, *Clostridia*, and *Salmonella*; see background and page 11 of the specification) to identify non-*Klebsiella* enzymes.

For the reasons cited above, the specification, read in light of the knowledge of the skilled person at the time the invention was made, is fully enabling for the scope of the claims. Applicants respectfully request the withdrawal of the rejection under 35 U.S.C. § 112, first paragraph.

Withdrawal of Rejections under 35 U.S.C. § 102:

The withdrawal of the rejections of Claims 2, 6, and 31 variously under 35 U.S.C. § 102 is acknowledged.

Submission of Formal Figures and Reference to Interim Waiver of 37 C.F.R. 1.84(b)(1):

Applicants refer to the Notice printed in the 4 August 1998 PTO Official Gazette providing for an interim waiver of 37 C.F.R. 1.84(b)(1) for petitions to accept black and white photographs. Applicants hereby request such a waiver from the objections under 37 CFR 1.84(b) noted on the PTO Form-948 dated 7 August 1997. Additionally, Applicants submit under cover of a document entitled "Transmittal of Formal Drawings"

the formal figures for originally submitted Figures 1 and 2 to correct deficiencies in the "Character of lines, numbers & letters" under 1.84(1) as noted on the PTO Form-948 dated 7 August 1997.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

A handwritten signature in cursive script, reading "Linda Axamethy Floyd".

LINDA AXAMETHY FLOYD
ATTORNEY FOR APPLICANTS
REGISTRATION NO. 33,692
TELEPHONE: 302-892-8112
FACSIMILE: 302-892-7949

Dated: 24 February 1999

EXPRESS MAIL LABEL NO.: EE353046515US